REMARKS

Applicants have now had an opportunity to carefully consider the Examiner's comments set forth in the Office Action mailed September 15, 2005. All the rejections are respectfully traversed. Amendment, reexamination and reconsideration of the application in light of the foregoing amendments and subsequent remarks, are respectfully requested.

The Office Action

The Examiner noted a problem with a drawing having an incorrect numeral. A replacement sheet of Fig. 2 is provided herewith and the Examiner's identification of the error is gratefully acknowledged.

All claims of the application were rejected for failing to define non-obvious subject matter over the combined teachings of two prior art references.

The Present Application

The present application is directed toward a method and system for detecting an ink stick jam in a solid to liquid ink phasing delivery system for supplying ink to a printer. An ink stick normally in a solid phase at room temperature is heated to a liquid state so that the liquid ink can be communicated to a print head. The phasing system includes a heater plate disposed to engage a solid ink stick and heat an engaging portion of the ink stick to the liquid phase. If the solid ink stick were somehow jammed and unable to contact the heater plate, during the normal ink melt duty cycle, not only could the print head reservoir run dry causing a catastrophic failure of the print job, but also, the continued application of power to elements of the heater can cause high temperature damage to the heater itself and to adjacent componentry. In particular, the print head could become clogged requiring expensive maintenance and repair with significant printer downtime.

A temperature sensing device associated with the heating plate detects the temperature thereof. A control system selectively supplies the power to the heater plate. The method comprises supplying a predetermined amount of power through the control system through the heater plate intended to achieve the desired melt rate of the ink stick during a phase change from solid to liquid. The desired melt rate is associated with a predetermined desired temperature of the heater plate. The temperature of the heater plate is sensed with a sensing device during the supply of power thereto. When a sensed temperature of the heater plate varies from a predetermined desired temperature by a selected amount, indicative of an ink jam and non-engagement of the ink stick to the heater plate, the supply power is interrupted, the ink stick jam can be corrected and heater damage and printer ink starvation can be avoided.

The References

The Examiner cited two references, Kanemoto et al. ('991) and Jones ('413). The Jones reference is commonly assigned to the owner of the subject application and is a fair representation of prior art ink phasing printers. However, it lacks the control system detection of an ink stick jam and is therefore a mere representation of a system suffering the very problems sought to be overcome with the system of the subject application.

Kanemoto et al. '991 also discloses an ink jet recording device utilizing hot melt ink and is particularly directed to a system which an additional rapid melt cycle, as well as a maintenance melting cycle required to maintain hot melt ink in a molten state. Heater 26 is disclosed to include an AC heater section 62 formed at one side of the base member 61, and a DC heater section 63 formed on the other side of the base member. The Kanemoto system energizes the AC heater section to effect the rapid melt cycle and energizes only the DC heater section for ink molten state maintenance. Thermisters 50 are disclosed for detecting temperature of the heaters. The temperature is the control used for disabling the AC power heater and maintaining the DC power heater when the temperature indicates that the temperature of the ink is higher than a predetermined temperature. Alternatively, when the temperature of the ink is below the predetermined temperature, the AC heater is turned on.

The Kanemoto reference fails to discuss whatsoever, any situation where there is no ink in the ink supply channel 16a or the ink reservoir 16b, such as may occur with an ink stick jam inhibiting the flow of ink to the area of the heater plate 26. Accordingly, although Kanemoto et al. teaches varying a supply of energy to the heater plate system in order to affect a rapid melt duty cycle when needed, there is no suggestion that the temperature sensing system can be used in any manner to detect an ink stick jam. More particularly, there is no teaching of the step of disabling the supply of power to the heater when temperature detection indicates that there is no ink flowing in the ink delivery system. Accordingly, Kanemoto et al. will suffer the same problems as sought to be overcome by the subject development, i.e., at least the DC heater will remain on at all times, even during the occurrence of an ink stick jam, the heater element can be overheated by the DC heater potentially causing high temperature damage to the print head and adjacent componentry, and the ink reservoir can become depleted for catastrophic failure of the print system.

As noted above, the system of Jones '413 similarly lacks such an ink jam detection system and a combination of the two references, Kanemoto et al. and Jones, would still result in a system

lacking apparatus and control steps for detecting the ink stick jam based upon a sensed temperature of a heater plate.

The Claims Distinguish Over The Combined Teachings Of The References

The Examiner will appreciate that amendments have been made in independent claims 1, 4 and 6 to better distinguish the subject method and system fro the references. More particularly, amendments have been made to clarify that the interruption of energy to the heater occurs upon temperature sensing indicative of non-engagement of the ink stick with the heater. Such temperature sensing of a temperature is higher than the normal melt cycle melting temperature.

CONCLUSION

In view of the foregoing, it is believed that all claims are now in condition for allowance and early notice thereof is respectfully requested. The foregoing comments do not require unnecessary additional search or examination.

In the event the Examiner considers personal contact advantageous to the disposition of this case, he/she is hereby authorized to call Patrick R. Roche, at Telephone Number (216) 861-5582.

Respectfully submitted,

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2/15/06
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